

AMENDMENT AND PRESENTATION OF CLAIMS

Please replace all prior claims in the present application with the following claims.

1. (Currently Amended) A method of creating an atrioventricular bypass tract for a heart, comprising:

growing mesenchymal stem cells *in vitro* into a strip with two ends;
attaching one end of the strip onto the atrium of the heart, and
attaching the other end of the strip to the ventricle of the heart, to create a tract connecting the atrium to the ventricle to provide a path for electrical signals generated by the sinus node to propagate across the tract and excite the ventricle.

3. (Original) The method of claim 1, wherein the stem cells are adult human mesenchymal stem cells.

4. (Original) The method of claim 3, wherein the step of growing comprises growing the stem cells in culture on a nonbioreactive material.

5. (Original) The method of claim 4, wherein the step of growing is performed in an environment substantially free of any additional molecular determinants of conduction.

6. (Currently Amended) The method of claim 1, further comprising a step of adding a gene-nucleic acid encoding a protein or peptide or biologically active fragment thereof to the mesenchymal stem cells by electroporation.

7. (Currently Amended) The method of claim 6, wherein the gene nucleic acid encodes for a connexin.

9. (Original) The method of claim 7, wherein the connexin includes connexin 43.

12. (Currently Amended) The method of claim 7 or 6, ~~wherein the step of adding a gene by electroporation includes adding the gene for connexins and further comprising adding genes a nucleic acid that encodes alpha and accessory subunits of an L-type calcium channel.~~

13. (New) The method of claim 6, wherein the nucleic acid encodes an HCN channel.

14. (New) The method of Claim 13, wherein the HCN channel is HCN2.